#### PATENT COOPERATION TREAT

WIPO

PCT

#### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or	agent's file reference	T			
BAR 20299		FOR FURTHER A	CTION	See Form PCT/IPEA/416	
International application No.		International filing date	(day/month/year)	Priority date (day/month/year)	
PCT/US04/09172		25 March 2004 (25.03.	2004)	27 March 2003 (27.03.2003)	
	tent Classification (IPC)	or national classification e	and IPC		
IPC(7): C12Q	1/04, 1/02; C12M 1/34, 3/	00 and US CL: 435/34, 29	, 287.1, 288.7		
Applicant					
WALKER, FIT	Z		<u> </u>		
.1. Thi Exa	s report is the internat mining Authority unde	ional preliminary exar r Article 35 and transm	nination report, establi	shed by this International Preliminary cording to Article 36.	
2. Thi					
3. Thi	3. This report is also accompanied by ANNEXES, comprising:				
a. J	· · · · · · · · · · · · · · · · · · ·		nal Bureau) a total of		
	sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).				
sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.					
b. [	(sent to the Internat	<i>ional Bureau only)</i> a to	tal of (indicate type and	number of electronic carrier(s))	
	, containing	a sequence listing and/ Supplemental Box F	or tables related thereto	, in computer readable form only, as Listing (see Section 802 of the	
4. This	report contains indicat	ions relating to the follo	owing items:		
$\boxtimes$		sis of the report	<b>3</b>		
	Box No. II Pric	ority .			
	Box No. III No.	n-establishment of opin licability	ion with regard to nove	lty, inventive step and industrial	
	==	k of unity of invention		•	
$\boxtimes$	Box No. V Rea	soned statement unde	r Article 35(2) with a	regard to novelty, inventive step or supporting such statement	
		tain documents cited		supporting such statement	
	Box No. VII Cer	tain defects in the inter	national application		
	Box No. VIII Cer	tain observations on the	e international application	on	
Date of submission of the demand		Date of completion of	this report		
26 October 2004 (26.10.2004)			01 4		
Name and mailing address of the IPEA/ US		01 August 2005 (01.08.2	2003)		
Mail Stop PCT, Attn: IPEA/US			Authorized officer		
Commissioner for Patents P.O. Box 1450			Telephone No. (571)	& Km	
Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230		Telephone No (57/)	222-1100		
orm PCT/IPEA/409 (cover sheet)(January 2004)				2., 2 , 000	



#### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.	
PCT/US04/09172	

Bo	χN	o. I Basis of the report
1.	Wit	th regard to the language, this report is based on the international application in the language in which it was filed, ess otherwise indicated under this item.
	Ш	This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
		international search (under Rules 12.3 and 23.1(b))
		publication of the international application (under Rule 12.4)
		international preliminary examination (under Rules 55.2 and/or 55.3)
•		n regard to the elements of the international application, this report is based on (replacement sheets which have been furnished we receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not exed to this report):
	$\boxtimes$	the international application as originally filed/furnished
l	X	the description:
		pages is 3.2 as originally filed/furnished.
		pages* NONE received by this Authority on
	<del>-</del>	pages* NONE received by this Authority on
Į	$\bowtie$	the claims:
		pagesas originally filed/furnished
		pages* NONE as amended (together with any statement) under Article 19
		pages* NONE received by this Authority on pages* 34-39 received by this Authority on 09 May 2005 (09.05.2005)
F	V	<u> </u>
Ŀ		the drawings:
		pages *NONE as originally filed/furnished pages* NONE received by this Authority on
		pages* NONE received by this Authority on
	_	a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.
з. [	_	The amendments have resulted in the cancellation of
		the description, pages
		the claims, Nos. 25 and 26
		the drawings, sheets/figs
		the sequence listing (specify):
		any table(s) related to the sequence listing (specify):
4. [	] ;	This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
	}	the description, pages
		the claims. Nos
	i	the claims, Nos.
	. !	the drawings, sheets/figs
	ļ	the sequence listing (specify):
	L	any table(s) related to the sequence listing (specify):
If ite	em 4	4 applies, some or all of those sheets may be marked "superseded."
- D/	-m/n	PRA//00 (Pov No. D. (January 2004)

#### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No. PCT/US04/09172

1. Statement			Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
		· ·			
Novelty (N)	Claims	1-24	YES		
	Claims	NONE	NO NO		
Inventive Step (IS)	Claims	NONE	YES		
	Claims		NO		
Industrial Applicability (IA)	Claims	1-24	YES		
22-11-11		NONE	NO		
2. Citations and Explanations (Rule 70.7) Claims 1-24 lack an inventive step under PCT Article 33(3) as being obvious over Yoon et al. (US 5,742,700) in view of Zhang et al. (US 2002/0165837).  Yoon et al. is relied upon for the reasons discussed above. Yoon et al. do not expressly teach using cluster parallel processing or a video camera therein.  Zhang et al. teach using a method of identifying various areas of interest in the medical field such as structural abnormalities including lesions caused by infection (thus, caused by pathogenic microorganisms - see, for example, paragraph 0142) such as by using an image segmentation algorithm to isolate one or more segments is each established by the claimed comparative digitized imaging steps. Zhang et al. also beneficially disclose that the information from medical samples can be analyzed via parallel processing and/or via cluster recursive algorithm enalysis of such segments (see, for example, paragraphs 0042, 0057, 0110, and 0112). Zhang et al. further beneficially disclose that an interface such as a video adapter (camera) can be effectively used in connection with the display device disclosed therein (see, for example, paragraph 0075).  It would have been obvious to one of ordinary skill in the art to incorporate the addition features taught by Zhang et al., as discussed above, within the method taught by Yoon et al. so as to help analyze the digital images within the Yoon et al. method. The result-effective adjustment in conventional working parameters (such as using a particular type of segmentation algorithm to analyze and compare such digital images) is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan.  Claims 1-24 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.					

### PCT/USO4/09172.09052005 IPFA/IS

1 A method for identifying pathogens, comprising:

3 providing an image;

4

- 5 processing the provided image with an image
- 6 segmentation algorithm to isolate at least one
- 7 segment of the provided image that has a feature
- 8 that is of interest, the image segmentation
- 9 algorithm comprising a recursive hierarchical
- segmentation algorithm; and

11

- 12 comparing the isolated segment of the provided image to
- a plurality of reference images to determine if the
- isolated segment corresponds to any of the reference
- images.

16

- 17 2. The method according to claim 1 wherein the step of
- 18 providing the image comprises acquiring the image.

19

- 20 3. The method according to claim 2 wherein the step of
- 21 acquiring the image comprises processing the acquired
- 22 image to provide pertinent portions of the acquired
- 23 image.

#### PCT/USO4/09172.09052005 \PEA/US

- 1 4. The method according to claim 2 wherein the step of
- 2 acquiring the image comprises digitizing the acquired
- 3 image.

4

- 5 5. The method according to claim 4 wherein the step of
- 6 acquiring the image further comprises digitally enhancing
- 7 the digitized image.

8

- 9 6. The method according to claim 5 further comprises
- 10 storing the digitally enhanced image in a data storage
- 11 device.

12

- 13 7. The method according to claim 1 wherein the provided
- 14 image comprises an image of a specimen.

15

- 16 8. The method according to claim 1 wherein the provided
- 17 image comprises a dental x-ray.

18

- 19 9. The method according to claim 1 wherein the step of
- 20 comparing the isolated segment to the plurality of
- 21 reference images comprises:

- 23 processing the isolated segment with a data mining
- 24 algorithm to extract particular image data from the

# PCT/USO4/09172.09052005

PEA/IS

1	isolated segment; and
2	
3	processing the extracted particular image data and each
4	of the reference images with an optical recognition
5	algorithm to determine if the extracted particular
6	image data matches any of the reference images.
7	
8	10. The method according to claim 9 further comprising:
9	
10	providing a display device; and
11	
12	displaying the extracted data and the results of
13	processing the extracted image data and each
14	reference image.
15	
16	11. The method according to claim 1 further comprising
17	providing a data base having a plurality of reference
18	images stored therein.
19	
20	12. A system for identifying pathogens, comprising:
21	
22	a device to provide an image;

a data base having at least one reference image stored

23

## PCT/USO4/09172.09052005

1	therein; and
2	
3	an image processing resource to (i) process the
4	provided image with an image segmentation algorithm
5	to isolate at least one segment of the provided
6	image that has a feature of interest, and (ii) to
7	compare the isolated segment of the provided image
8	to the reference image to determine if the isolated
9	segment corresponds to the reference image, the
10	image segmentation algorithm comprising a recursive
11	hierarchical segmentation algorithm.
12	

12

The system according to claim 12 wherein the device 13 comprises a device to acquire the image. 14

15

The system according to claim 13 wherein the device 16 comprises a digitizer to digitize the provided image. 17

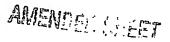
18

19

The system according to claim 14 wherein the device further comprises an enhancer device to digitally enhance 20 21 the digitized image.

22

The system according to claim 15 further comprising 23 a data storage resource for storing the digitized images. 24



## PCT/USO4/09172.09052005 PEANS

- 1 17. The system according to claim 12 wherein the
- 2 provided image comprises an image of a specimen.

3

- 4 18. The system according to claim 12 wherein the
- 5 provided image comprises a dental x-ray.

6

- 7 19. The system according to claim 12 wherein the image
- 8 processing resource is configured to process the isolated
- 9 segment with a data mining algorithm to extract image
- 10 data from the isolated segment.

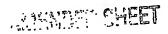
11

- 12 20. The system according to claim 19 wherein the image
- 13 processing resource processes the extracted image data
- 14 and the reference image with an optical recognition
- 15 algorithm to determine if the extracted image data
- 16 matches the reference images.

17

- 18 21. The system according to claim 20 further comprising
- 19 a display device to display the extracted data and the
- 20 results of processing the extracted image data and the
- 21 reference image with the optical recognition algorithm.

- 23 22. The system according to claim 12 wherein the image
- 24 processing resource comprises a paralleling processing



#### PCT/USO4/09172.09052005 |PEA/IS

1 resource.

2

- 3 23. The system according to claim 22 wherein the
- 4 paralleling processing resource comprises a Beowulf
- 5 cluster.

6

- 7 24. The system according to claim 12 wherein the device
- 8 comprises a video camera.